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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,166	09/04/2001	Kazuhito Okayama	0102/0180	9857

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EXAMINER

JACKSON, JAKIEDA R

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 07/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,166

Applicant(s)

OKAYAMA ET AL.

Examiner

Jakieda R Jackson

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 7, and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (U.S. Patent No. 3,795,876), hereinafter referenced as Takahashi, in view of Covell et al. (U.S. Patent No. 5,828,994), hereinafter referenced as Covell.

Regarding **claims 1, 7 and 11**, Takahashi discloses an audio signal processing apparatus, method and computer-readable program in which a digital audio signal to be replayed is processed in a waveform thereof, the apparatus comprising:

frequency bandwidth expanding means (expansion system) for expanding a frequency bandwidth of the digital audio signal through conversion (variable frequency characteristic change means) of a sampling frequency at which the digital audio signal is sampled (column 2, lines 52-60);

low-pass filtering means (low pass filter) for performing low-pass filtering on the digital audio signal expanded in the frequency bandwidth (signal having frequency expanded), the low-pass filtering involving a cut-off frequency (cut-off frequency)

corresponding to the converted sampling frequency (column 10, lines 5-23 and lines 55-62); and

detecting means for detecting an interval of time (delay-time) between two waveform peaks (between the filters) of the low-pass-filtered digital audio signal (column 10, lines 42-45), but lacks a difference data calculating means, weighing means and producing means.

Covell discloses an audio signal processing apparatus, method and computer-readable program, comprising:

difference data calculating means for calculating difference data (spectral difference) between current data of the low-pass-filtered digital audio signal (current frame) and past data of the low-pass-filtered digital audio signal (previous frame; column 7, line 65 – column 8, line 6), to allow changes on the time scale;

weighting means for weighting the difference data depending on the interval (weighing spectral difference; column 8, lines 23-39), to remove long-term data; and

producing means for producing output data (resulting data) based on the low-pass-filtered digital audio signal and the weighted difference data (column 8, lines 23-42), to provide a balance.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takahashi's invention such that it discloses calculating means, weighing means and producing means, to facilitate high rates of expansion while maintain the intelligibility of the resulting sounds (column 1, lines 6-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takahashi's invention such that the past data are sampled by one sampling period prior to the current data, to provide a measure of energy that captures the relative changes in emphasis, to prevent sounds with high energy values from completely dominating all other sounds (column 6, lines 36-67).

3. **Claims 2-6 and 8-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al. (U.S. Patent No. 3,795,876), hereinafter referenced as Takahashi, in view of Covell et al. (U.S. Patent No. 5,828,994), hereinafter referenced as Covell in further view of Ding et al. (Proceedings of the 1998 IEEE International Conference, Determining polarity of speech signals based on gradient of spurious glottal waveforms), hereinafter referenced as Ding.

Regarding **claims 2 and 8**, Takahashi in view of Covell disclose an audio signal processing apparatus, method and computer-readable program wherein the detecting means include means for detecting the interval of time two adjacent waveform peaks (Takahashi; column 9, lines 53-58), but lacks the polarities of gradients of the waveform differing from each other.

Ding discloses determining a polarity of speech signals wherein the polarities of the gradients of the waveform differ from each other (figure 2 and section 2.2; page 858-859), to monitor the waveform.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takahashi in combination with Covell such that the polarities of gradients of waveform differ from each other, to yield a robust and accurate polarity of normal or pressed voices, to obtain a reliable detection of speech polarity (page 860).

Regarding **claim 3**, Takahashi disclose an audio signal processing apparatus, method and computer-readable program in which a digital audio signal to be replayed is processed in a waveform, but lacks wherein the interval of time of the two adjacent waveform peaks is measured by the number of times of sampling.

Covell discloses the apparatus, method and computer-readable program wherein the interval of time of the two adjacent waveform peaks (column 9, lines 32-33) is measured by the number of times of sampling (time span; column 6, lines 30-50), to facilitate time scale modification of audio with high rates of expansion.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takahashi's invention such that is discloses calculating means, weighing means and producing means, to facilitate high rates of expansion while maintain the intelligibility of the resulting sounds (column 1, lines 6-11).

Regarding **claims 4 and 9**, Takahashi disclose an audio signal processing apparatus, method and computer-readable program in which a digital audio signal to be replayed is processed in a waveform, but lacks that the past data are sampled by one sampling period prior to the current data.

Covell discloses the apparatus, method and computer-readable program wherein the past data of the low-pass-filtered digital audio signal used in difference data calculating means (column 8, lines 23-39) are sampled by one sampling period prior to the current data (figure 4; column 6, lines 36-50), to thereby capture the full range of different sounds.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takahashi's invention such that the past data are sampled by one sampling period prior to the current data, to provide a measure of energy that captures the relative changes in emphasis, to prevent sounds with high energy values from completely dominating all other sounds (column 6, lines 36-67).

Regarding **claims 5 and 10**, Takahashi in view of Covell disclose an audio signal processing apparatus, method and computer-readable program wherein the weighting means is configured so as to weight the difference data (Covell; weighted spectral difference; column 8, lines 23-39), but lacks the data depending on the interval and the polarities of the gradients.

Ding discloses an apparatus, method and computer-readable program wherein the data depends on the interval and the polarities of the gradients (section 2.2; page 858-859), to monitor the waveform.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takahashi in combination with Covell such that the data depends on the interval and the polarities of gradients, to yield a robust and

accurate polarity of normal or pressed voices, to obtain a reliable detection of speech polarity (page 860).

Regarding **claim 6**, Takahashi disclose an audio signal processing apparatus, method and computer-readable program in which a digital audio signal to be replayed is processed in a waveform, but lacks the configuration wherein the weighted difference data is added to the low-pass filtered digital audio signal.

Covell discloses the apparatus, method and computer-readable program wherein the producing means is configured so as to weight the difference data (difference values) to the low-pass filtered digital audio signal (column 8, lines 33-35), to obtain the average weighted spectral difference as a function of time.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takahashi's invention such that wherein the weighted difference data is added to the low-pass filtered digital audio signal, to remove long-term data.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kitamura et al. (U.S. Patent No. 4,020,291) discloses a system for time compression and expansion of audio signals.
- Slagley (U.S. Patent No. 4,461,022) discloses expandable bandwidth compression and restoration system.

- Rogalski (U.S. Patent No. 5,159,636) discloses and audio signal expander apparatus.
- Hasegawa (U.S. Patent No. 5,893,068) discloses a method expanding a frequency range of a digital audio signal without increasing a sampling rate.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703. 305.4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W. R. YOUNG
PRIMARY EXAMINER

JRJ
July 6, 2004